Ordering number: EN4392A

Monolithic Digital IC

LB1674V

Brushless, Sensorless Motor Driver

Overview

The LB1674V is a small motor driver ideal for mini-cassettes, headphone stereos and micro-cassettes.

Functions and Features

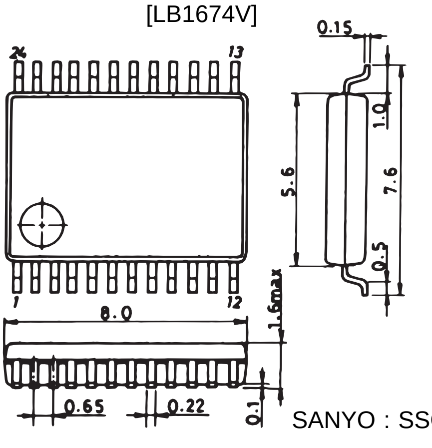
- 3-phase unipolar, brushless, sensorless motor driver
- Reverse function
- Built-in speed control function (V servo)
- Built-in reference voltage (0.5 V)
- Soft switching driver

Package Dimensions

unit : mm

3175A-SSOP24

[LB1674V]



SANYO : SSOP24

Specifications

Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max		5	V
Output transistor withstand voltage	Vsus		10	V
Maximum output current	Im max		0.6	A
Allowable power dissipation	Pd max	Tj = 125°C	0.4	W
Operating temperature	Topr		0 to + 80	°C
Storage temperature	Tstg		–40 to + 125	°C

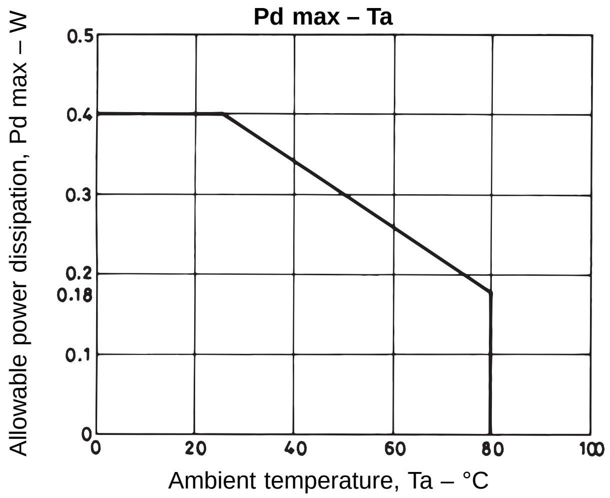
Allowable Operating Range at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V_{CC}		1.0 to 3.5	V

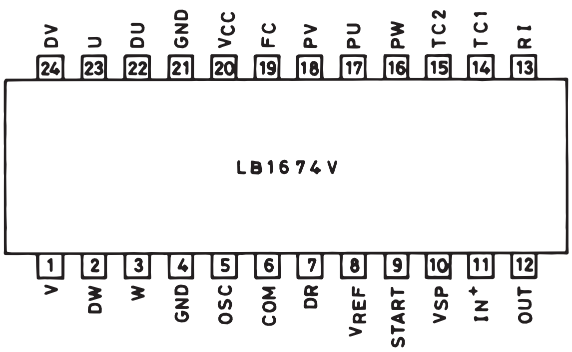
SANYO Electric Co.,Ltd. Semiconductor Bussiness Headquarters
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110 JAPAN

Electrical Characteristics at Ta = 25°C, V_{CC} = 1.5 V, unless otherwise noted

Parameter	Symbol	Conditions	min	typ	max	Unit
Supply current	I_{CC}	START pin: high		6.5	10	mA
		START pin: low		0	10	µA
Reference voltage	Vref		0.47	0.50	0.53	V
Reference-voltage characteristic	$\frac{\Delta Vref}{Vref} / \Delta V_{CC}$	V_{CC} = 1.0 to 3.5 V		1	1.5	%/V
Reference-voltage load characteristics	$\frac{\Delta Vref}{\Delta Iref}$	Iref = 0 to –50 µA	–0.2	–0.06		mV/µA
Reference-voltage temperature characteristics	$\frac{\Delta Vref}{Vref} / \Delta Ta$	Ta = 0 to 80°C		0.01		%/°C
Speed signal detection accuracy	Vsp	V_{IN} = 750 mV	140	155	170	mV
Speed signal interphase error			–5		+5	%
Speed-signal voltage characteristics	$\frac{\Delta Vsp}{Vsp} / \Delta V_{CC}$	V_{CC} = 1.0 to 3.5 V		2	3	%/V
Speed-signal temperature characteristics	$\frac{\Delta Vsp}{Vsp} / \Delta Ta$	V_{IN} = 0.75 V, Ta = 0 to 80°C		0.05		%/°C
Current detection accuracy	V_{RI}	$V_{IN}1$ = 0.3 V, $V_{IN}2$ = 1.0 V, RI = 330 Ω	70	85	100	mV
Current detection ratio	K_I	$V_{IN}1$ = 0.3 V, $V_{IN}2$ = 1 to 1.3 V	0.17	0.22	0.27	
Starting pulse period	T_S	C_S = 0.1 µF		32		ms
COM⊖ lead-in current	$I_{COM⊖}$		25	35	45	µA
Output saturation voltage	Vsat	V_{CC} = 1.0 V, Im = 0.3 A		0.15	0.25	V
Logic input high-level voltage	V_H		0.9			V
Logic input low-level voltage	V_L				0.3	V
TC pin lead-in current	I_{TC}		35	50	65	µA

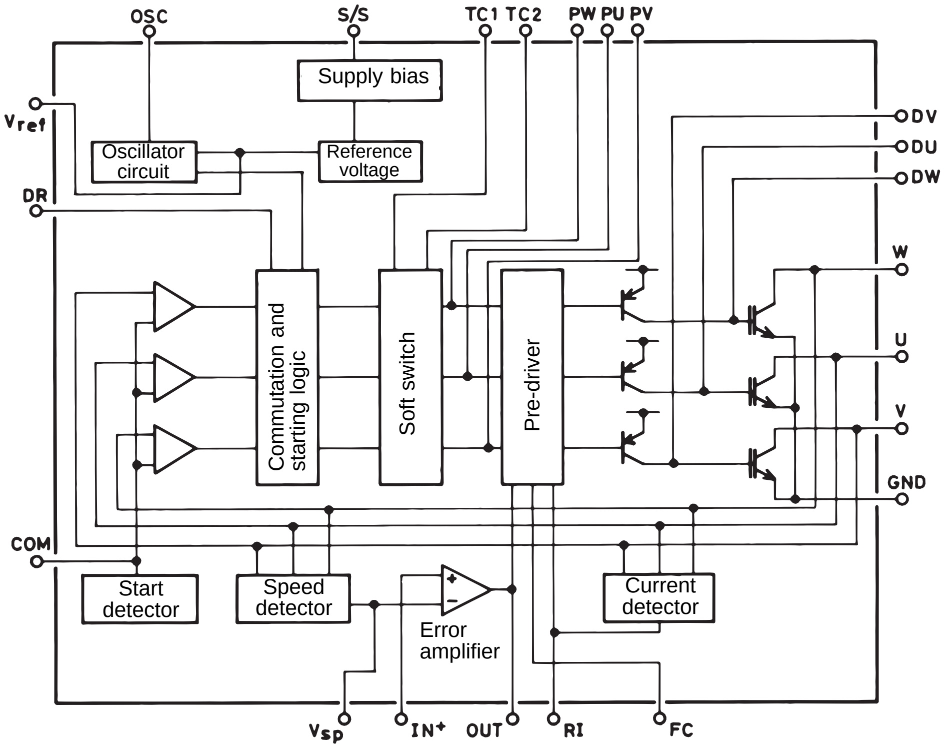


Pin Assignment

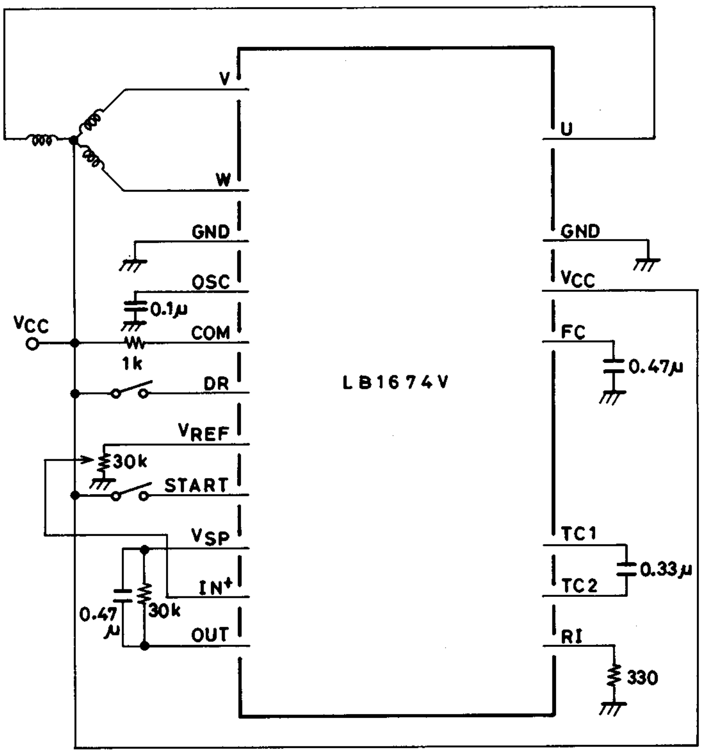


Top view

Equivalent Circuit Block Diagram



Sample Application Circuits at V_{CC} = 1.5 V

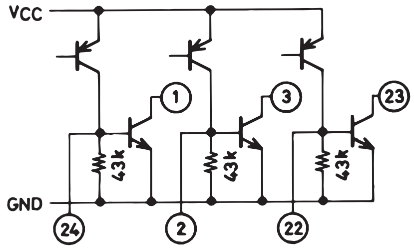
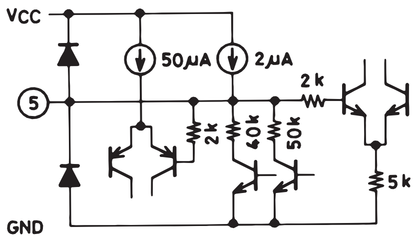
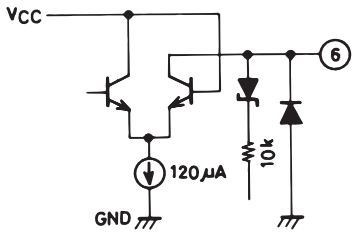
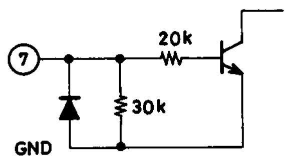
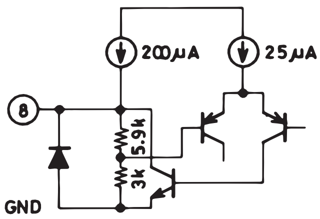
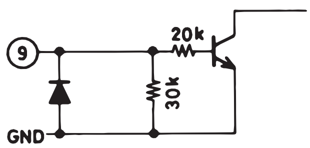
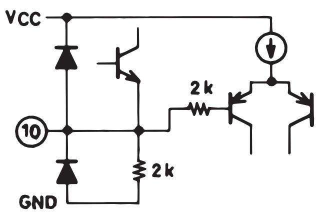


Note:
PU, PV and PW are internal operation measurement pins.

Unit (resistance: Ω, capacitance: F)

Pin Description

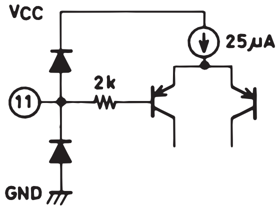
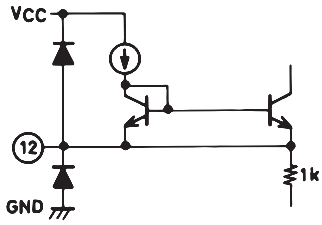
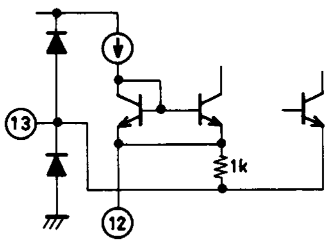
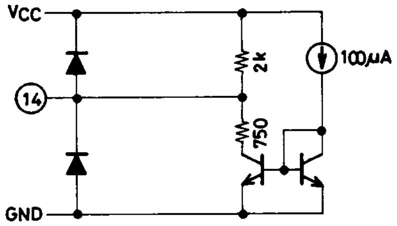
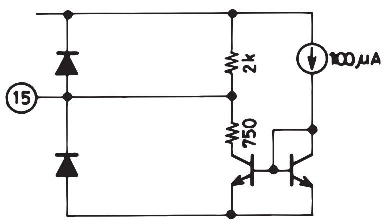
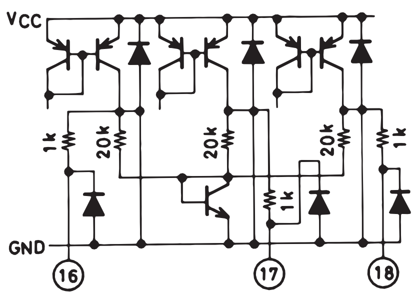
Unit (resistance: Ω)

Pin Number	Pin Name	Equivalent Circuit	Description
1 3 23	V W U		• Motor coil connection pins
2 22 24	DW DU DV		• Power transistor base pins
4	GND		• Power and signal ground
5	OSC		• Starting pulse period set pin
6	COM⊖		• Start-up waveform detection circuit offset set pin
7	DR		• Drive direction switch pin (normally low)
8	Vref		• Reference voltage pin (0.5 V)
9	START		• Start/stop control pin. Active-high
10	Vsp		• Speed signal (motor induction voltage) detector

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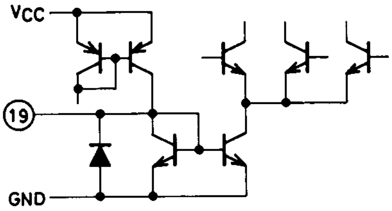
Unit (resistance: Ω)

Pin Number	Pin Name	Equivalent circuit	Description
11	IN+		• Speed signal error amplifier reference input pin
12	OUT		• Speed signal error amplifier output for motor current feedback
13	RI		• Motor current detection pin
14	TC1		• Motor current rising/falling time constant set pins
15	TC2		• Motor current rising/falling time constant set pins
16 17 18	PW PU PV		• Current waveform generator. Internal operation measurement pins. Must be left open.

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Unit (resistance: Ω)

Pin Number	Pin Name	Equivalent circuit	Description
19	FC		• Abnormal oscillation stop pin
20	V_{CC}		• Power supply
21	GND		• Power and signal ground